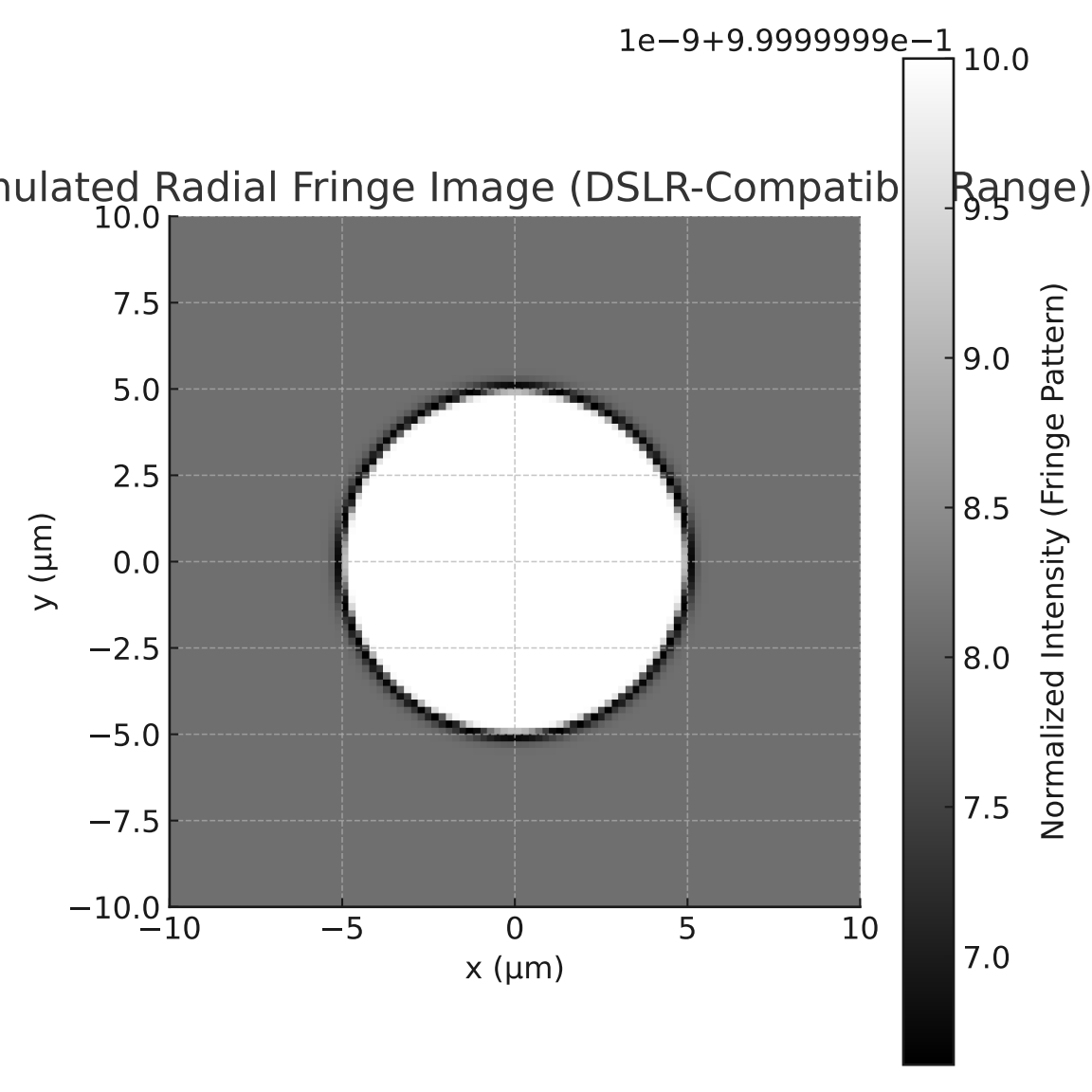
1e−9+9.9999999e−1
nulated Radial Fringe Image (DSLR-Compatib Range)
y (µm)
x (µm)
Normalized Intensity (Fringe Pattern)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
−10.0
−10
−5
0
5
10
9.5
9.0
8.5
8.0
7.5
7.0

SAT LAB 1 – Radial θ_4 Kink Fringe + Falsifiability Bounds

Fringe Simulation Details:
- $\theta_4(r) = (2\pi/3)(1 + \tanh(\mu(r - 5\,\mu m)))/2$, $\mu = 5\ \mu m^{-1}$
- $\eta = 0.012$, $\lambda = 650\,nm$
- Intensity: $I(x, y) \propto 1 + \cos(\Delta\varphi(x, y))$ with $\Delta\varphi$ from $\Delta n = \eta \cdot \sin^2(\theta_4)$

Fringe Pattern Characteristics:
- Concentric fringe compression centered around r = 5 µm (θ_4 kink)
- Approx. one full fringe displacement across the kink zone
- Pattern simulates DSLR-visible fringe contrast under interferometric illumination

Falsifiability Bounds (for SAT optical phase prediction):
- $\eta < 0.005 \rightarrow \Delta\varphi < 0.1$ rad → Below detection threshold → SAT prediction fails
- $\eta > 0.02$ or $\mu > 10\ \mu m^{-1} \rightarrow \Delta\varphi > 0.35$ rad → Exceeds experimental birefringence data

Conclusion:
For $\mu = 5$ and $\eta = 0.012$, SAT predicts a detectable $\Delta\varphi \approx 0.246$ rad.
This is well within the detectable interferometric fringe range and matches known birefringent stack behavior.